Does Prior Knowledge influence Learners Cognitive and Metacognitive Strategies over Time during Game-based Learning?

Daryn Dever
University of Central Florida, Orlando, Florida, United States

Elizabeth Cloude
University of Central Florida, Orlando, Florida, United States

Roger Azevedo
University of Central Florida, Orlando, Florida, United States

Abstract

Learners ability to effectively monitor and apply cognitive (e.g., reading) and metacognitive (e.g., content evaluations) strategies in game-based learning environments (GBLEs) are influenced by internal factors such as prior knowledge. This study examined whether there were differences in learners strategy usage over time during learning with Crystal Island, a GBLE for microbiology, between high and low prior knowledge groups. Results indicated that learners with high prior knowledge had greater posttest scores, but spent less time reading. This is further influenced by relative time in game where learners with high prior knowledge have greater reading durations at the start of the game, but smaller durations towards the end compared to low prior knowledge learners. Learners' metacognitive strategy usage did not differ between prior knowledge groups, but the use of this strategy increased over time. Implications for designing adaptive GBLEs from learners cognitive and metacognitive strategy use are discussed.